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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/804,913
Filing Date: March 19, 2004
Appellant(s): BARHORST ET AL.

Maria Eliseeva
For Appellants

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 22, 2008 appealing from the Office action mailed February 7, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellants' statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,303,891	GAULT	10-2001
4,800,131	MARSHALL ET AL.	01-1989
4,463,243	CHURCH	07-1984

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gault (US 6,303,891), and further in view of Marshall et al (US 4,800,131).

Gault discloses the method for GMAW for ferrous alloy comprising the steps of feeding a consumable electrode into a GMAW apparatus, using Argon as the shielding

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gas and *less than 1% of Nitrogen, since Nitrogen is not present in the gas* (abstract), then igniting an arc between the ferrous alloy workpiece and the electrode. Gault fails to teach the core having a sheath with metal powder up to 44% wt of the core composition.

However, Marshall et al. disclose using a metal-core having a sheath for the purpose of improving bead appearance and joint quality (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have core with a sheath as taught by Marshall et al., in Gault, in order to improve the joint quality. In addition, Marshall et al. does not teach the powder weight percentage. However, Marshall mentions the diameter range and the powder composition. Therefore, it would have been obvious to use 44% wt of powder, since the amount would depend on the weld quality desired.

3. Claims 37-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gault (US 6,303,891), and further in view of Marshall et al (US 4,800,131), in view of Church (US 4,463,243).

Gault and Marshall et al. disclose the claimed invention above, but lacks the mentioning of oxygen content less than 0.06%, fume generation not exceeding 0.25 gms/min, arc with standard deviation of 0.2V to 0.3 V, and toughness of weld at 0 F at least 50ft-lb and 41 ft-lb at -20 F.

However, Church discloses using shielding gas having oxygen content between 0.1 to 1% (col. 7, line 62 – col. 8. line 17) for the purpose of permitting smaller diameter

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wires to carry higher current densities. In addition, Church discloses specific gas mixtures are varied with metal or metal alloys being welded (col. 8, lines 15-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to have oxygen content less than 0.06%, since this would depend on the metals to be welded. Furthermore, it would have been obvious to have fume generation not exceeding 0.25 gms/min, arc with standard deviation of 0.2V to 0.3 V, and toughness of weld at 0 F at least 50ft-lb and 41 ft-lb at – 20 F, since based on Church's disclosure that gas mixture will depend on the metal or metal alloys.

(10) Response to Argument

With regard to the appellants' remarks/arguments in the Argument section on pages 3-8 of the Appeal Brief, the appellants have provided arguments addressing the 35 USC 103(a) rejections of claims 1-3 and 37-41 (of which claim 1 is the only independent claim) as follows:

Issue I) the 35 USC 103(a) rejections of claims 1-3 over Gault (US 6,303,891) in view of Marshall et al. (US 4,800,131) (appellants' arguments provided on pages 3-7 of the brief); and

Issue II) the 35 USC 103(a) rejections of claims 37-41 over Gault (US 6,303,891) in view of Marshall et al. (US 4,800,131), and further in view of Church (US 4,463,243) (appellants' arguments provided on pages 7 and 8 of the brief).

Regarding Issue I, for which the appellants' arguments are presented throughout pages 3-7 of the brief, the appellants argue (in the 1st full paragraph on page 4 of the brief) that the claim 1 limitation *"using Ar to form a non-oxidizing shielding atmosphere around the consumable metal-core electrode"* is allegedly not met, followed by the statement *"Nitrogen is not even present in the gas"*. Regarding the latter statement, it appears as though the appellants believe that the examiner's mention of no "nitrogen" applies to claim 1, when in fact it applies and clearly meets the limitation of claim 2. In this instance, the claim 2 limitation *"less than 1% of a residual amount of N₂, N₂O₅, O₂ or CO₂"* is met since there is **no nitrogen** in the argon-based shielding gas of Gault. When taken in view of the term "or" in claim 2, this limitation is met since the first two nitrogen-containing gases are absent from the teachings of Gault, and the appellants even make this admission (see above).

With regard to the disputed interpretation of the "non-oxidizing" shielding atmosphere of claim 1, the appellants' claim 2 reads *"less than 1% of.....O₂..."*, whereas Gault discloses a shielding gas mixture of 96% argon, 3% carbon dioxide, and 1% oxygen. In other words, if the limitation *"less than 1% oxygen"* of claim 2 (which could be interpreted as almost about 1%, such as 0.9%, 0.99% etc.) is considered by the appellants to also be "non-oxidizing", then this is in contradiction to their arguments as applied to claim 1. In addition, if the ambient atmosphere comprises 20% oxygen, then a 1% oxygen-containing shielding gas would be considered to be "non-oxidizing" in comparison, but it is important to note that a review of the appellants' claims 1 and 2 appears to show that "less than 1%" oxygen is considered to be "non-oxidizing" from the

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appellants' point of view as well. Since the appellants are only claiming "non-oxidizing" in claim 1, this limitation does not define over the Gault reference, as a non-oxidizing atmosphere for the weld is established by Gault.

With regard to the arguments presented throughout the 2nd full paragraph on page 4 and the paragraph bridging pages 4 and 5, the appellants argue that both carbon dioxide and oxygen are considered to be "oxidizers" (of at least 4% total in Gault). The examiner strongly disagrees, as the appellants' statement that carbon dioxide is considered to be an "oxidizer" is clearly in error (carbon dioxide gas does not "break down" or otherwise "convert" into oxygen, nor does one of ordinary skill in the welding art use carbon dioxide as a means for obtaining an "additional" source of oxygen adjacent the region to be welded), and thus the "at least 4%" argument does not apply to claims 1 and 2, as oxygen is the only "oxidizer" present in the shielding gas.

On the top of page 5 of the brief, it is noted that Gault does not specifically disclose that the metal-core electrode has a "sheath" and a core (of claim 1) and the metal powder "up to 45%" (which could be interpreted as 0 to 45%). However, Marshall et al. (see abstract) discloses that the core includes a "sheath" in the composite welding filler wire that comprises powder materials, including 40-60% nickel and a remainder of iron (of up to either 40% or 60% -- see Example 1 of Marshall et al.). Example 5 of Marshall et al. also discloses the features of claim 3. As a result, the claimed "metal powder" of "up to 45% wt" is the "nickel powder" of Marshall et al., and the "iron powder" of claim 3 is expressly disclosed as the "remainder" iron (which can range from 0 to 44% as claimed). Moreover, one of ordinary skill in the art would have recognized the

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obviousness of the claimed ranges disclosed by Marshall et al., as set forth in MPEP 2144.05. "In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists.". *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215 (CCPA 1980). Moreover, Marshall et al. disclose the advantage of the core and sheath for improved weld bead appearance and joint quality (see abstract).

With regard to the arguments addressing claim 2 (see the 1st full paragraph on page 5 of the brief), the interpretation of the limitation "*less than 1% of a residual amount of N₂, N₂O₅, O₂ or CO₂*" is met since there is **no nitrogen** in the argon-based shielding gas of Gault. A detailed response to the appellants' arguments pertaining to claim 2 is set forth above.

With regard to the argument addressing claim 3 (see the paragraph bridging pages 5 and 6 of the brief), claim 3 sets forth a metal powder of "up to 45% wt" (which could be interpreted as 0 to 45%) and an iron powder of "up to 44 wt" (which could be interpreted as 0 to 44%). However, Marshall et al. disclose and/or suggest such ranges in Example 1 (see above section pertaining to claim 3). Regarding the remainder of page 6 of the brief, the appellants discuss several of the examples disclosed by

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Marshall et al. However, the appellants have misinterpreted Example 1, which states *"composite wires having a nominal composition of from 40% to 60% nickel, remainder iron, were made...."*, and other examples of Marshall et al. show a "metal powder" (e.g. nickel) of 0-45%wt, as well as an iron powder of 0-44%wt., and Example 5 shows a *"metallic powder cored wire having a nominal composition of 37% nickel—30% chromium—33% iron"* (column 4, lines 9-10). In view of Examples 1 and 5, the appellants' statement *"the wires in Examples 1, 2, 3, 5, and 6 don't even have iron in their cores"* (at the bottom of page 6 of the brief) is incorrect. In summary, the combination of Gault and Marshall et al. establishes a *prima facie* case of obviousness.

As a result, the combination of Gault and Marshall et al. renders obvious the claimed features of claims 1-3, and it is the examiner's position the 35 USC 103(a) rejections of these claims be maintained.

Regarding Issue II, for which the appellants' arguments are presented throughout pages 7 and 8 of the brief, the appellants argue (in the last two paragraphs on page 7 of the brief) that the combination of Gault, Marshall et al., and Church allegedly does not render claims 37-41 obvious. First, it is noted that the limitations *"oxygen in the weld metal not exceeding 0.06% wt"* and *"the metal-core wire comprises oxygen"* of claims 37 and 38, respectively, show that the metal-core wire includes oxygen without it becoming absorbed in the weld metal. From this view, the concentration of oxygen in the shielding gas would not be the only factor in the amount of oxygen in the weld metal, or otherwise claims 37 and 38 would be in contradiction (by having a filler wire

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comprising oxygen, which will become part of the weld metal upon completion of the welding process, to result in less than 0.06% wt for the weld metal). Regarding the Church reference (see columns 7 and 8), Church discloses one embodiment with 0.1% to 1% oxygen (in the table at the top of column 8), another embodiment with no oxygen (85% argon and 15% carbon dioxide -- in the table at the bottom of column 8), and even discloses 100% carbon dioxide (column 8, line 60 through column 9, line 6). In the absence of oxygen (or in a "low" concentration that the appellants set forth in claim 38), one of ordinary skill in the art would have recognized that low or almost no oxygen in the weld metal (of which no oxygen is desired in the weld metal since oxygen creates porosity/weakness in the weld metal) is desired. Accordingly, the use of various gas mixtures disclosed by Church would serve to minimize absorbed oxygen in the weld metal, and is dependent upon the metals or metal alloys being welded and the size of the weldment desired (Church; column 8, lines 15-17). In addressing claims 39-41 (in the two paragraphs on page 8 of the brief), the appellants state that these limitations allegedly would not be met upon combining the prior art references. The examiner respectfully disagrees, as a low fume generation rate, improved arc stability, and improved toughness of weld metal are all highly desirable features to be attained in the welding field. Regarding the claimed ranges, it would have been obvious to one of ordinary skill in the art at the time of the invention to choose the instantly claimed ranges through process optimization, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA

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1980). Moreover, the advantages of optimizing these parameters include reduced fume emission and improved weld joint quality/strength.

As a result, the combination of Gault, Marshall et al., and Church renders obvious the claimed features of claims 37-41, and it is the examiner's position the 35 USC 103(a) rejections of these claims be maintained.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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